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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/833,139	04/11/2001	Mark E. Kuznetsov	1058-US	1637
25263	7590	01/09/2004	EXAMINER	
J GRANT HOUSTON AXSUN TECHNOLOGIES INC 1 FORTUNE DRIVE BILLERICA, MA 01821			VY, HUNG T	
			ART UNIT	PAPER NUMBER
			2828	

DATE MAILED: 01/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/833,139

Applicant(s)

KUZNETSOV, MARK E.

Examiner

Hung T Vy

Art Unit

2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.


- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

  
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### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.  
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11. 6) ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

1. In response to the amendment filed on 11/24/2003 claims 1-21 are pending in this application as a result of the addition of claim 21.

### **Acknowledges**

2. Receipt is acknowledged of the following items from the Applicant.

Information Disclosure Statement (IDS) filed on 11/24/2003 and made of record as Paper No. 11. The references cited on the PTOL 1449 form have been considered.

### **Claim Rejections - 35 USC § 112**

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP §2172.01. The claims recite an optical resonator cavity comprising at least two mirrors without the recitation of any means or structure limitations to conform the optical resonator. The claims only recite a mathematical equation with a numerical value less than 3.5. The numerical value 3.5

Art Unit: 2828

also fails provide any unit. The claims fail to provide a clear definition of  $V_r$  and the criticality of the equation with respect to the curvature equation of the concave mirror. The claims fail to recite any means plus function to clearly define the optical resonator profile as required under 35 U.S.C. 112, 2<sup>nd</sup> paragraph. Furthermore, the equation does not make sense in such a way that the equation only represents a value of the cavity, which the value is considered as an experimental value. The claims fail to clearly define any structural relationship of the mirrors in view of the equation in order to reduce the mirror sag of the invention, therefore the claims are directed into the subject matter of mathematical algorithm/equation which fall into the 35 U.S.C. 101 category without the recitation of any limitations recited in the claims to qualify under MPEP §2106 and MPEP §2107, which render the claims confusing, vague, and indefinite.

### **Claim Rejections - 35 USC § 102**

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-21 are rejected under 35 U. S. C. § 102 (b) as being anticipated by Hendow et al., U.S. patent No. 5,418,641.

Art Unit: 2828

With respect to claims 1,7, 12, 20 and 21, the patent to Hendow et al discloses a Fabry Perot optical resonant cavity comprising at least two mirror structure (22 and 21) as shown in figure 6. Figure 6 shows a convex mirror and a plane mirror with a distance L. Using the center of curvature equation with respect to the wavelength and the diameter of the concave mirror. It is inherent to calculate the  $V_r$  with respect to the decided value such about 3.5 as recited in the claim.

Regarding claims 2-6, 8-11 and 13-19, with the same structure as two mirrors (22 and 21) so optical resonator have the same value as application.

7. Claims 1-21 are rejected under 35 U. S. C. § 102 (b) as being anticipated by Eda et al., U.S. patent No. 6,178,035.

With respect to claims 1,7, 12, 20 and 21 the patent to Eda et al. discloses a Fabry Perot optical resonant cavity comprising at least two mirror structure (13 and 14) as shown in figure 7. Figure 7 shows laser medium with a convex mirror and a plane mirror with a distance L. Using the center of curvature equation with respect to the wavelength and the diameter of the concave mirror. It is inherent to calculate the  $V_r$  with respect to the decided value such as 3.5 as recited in the claim.

Regarding claims 2-6, 8-11 and 13-19, with the same structure as two mirrors (13 and 14) so optical resonator have the same value as application.

### **Response to Arguments**

Art Unit: 2828

8. Applicant's arguments filed on 10/24/2003 have been fully considered but they are not persuasive.

9. Response to applicant's argument on page 5 - 7, the applicant argues for the rejection 35 U.S.C. 112, second paragraph. In the first and second applicant's argument, the arguments are not persuasive because the equation represents a numerical value of the cavity which is considered as an experimental value in order to optimize the output of the laser. The claim just recites two-mirror structure. It is not patentable over the reference. Further, applicant admitted the  $V_r$  and values 3.5 was made by applicant for the purpose of clarity (See page 5, line 18) and the claim recites the structure of two mirrors. The claims are not patentable over the reference of the rejection.

10. In the third and fourth applicant's argument, the arguments are not persuasive because the formula with defines the quantity  $V_r$  in terms of the refractive index, wavelength, length of the optical cavity, and sag of the net mirror to determine a numerical value of the cavity. One person having ordinary skill in the art at the time the invention was made would be able to derive the equation with two mirrors.

Furthermore, the equation presents numerical value. It fails to define any structure as an invention. Therefore, the claims are not patentable over the reference of the rejection.

11. The claims fails to recite the structure to get minimize those modes (See detail on rejection 112 above). The invention just recites the structure of two mirrors with the recitation of an equation which applicant admitted as a design choice or clarity in the


Art Unit: 2828

argument. Since Hendow et al. shows in figures 6 a concave mirror and a plane mirror with a distance L, it is inherent to use the center of curvature equation with respect to the wavelength and the reflection index to produce the  $V_r$  result such as a value of decided, in this case, the value is 3.5 as recited in claim. Accordingly, the claims are not patentable distinct from Hendow et a.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung VY whose telephone number is (703) 605-0757. The examiner can normally be reached on Monday-Friday 8:30 am - 5:30pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul IP can be reached on (703) 308-3098. The fax numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Hung T. Vy  
Art Unit 2828

  
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December 17, 2003

Application/Control Number: 09/833,139

Page 7

Art Unit: 2828